The layer 2 virtual circuits recited in the claims of the present application are explained as being supported by a PE (Provider Edge) interface having a single layer 3 address in the VPN, for communication with remote CE (Customer Edge) devices. For example, when using Ethernet as a PE interface, the layer 2 virtual circuits are said to be VID-based, that is each layer 2 virtual circuit is designated with a VLAN ID referring to a given VLAN (see e.g. page 7, lines 2-5 ; page 8, line 10 and page 9, lines 6-7 of the application as filed). This is in accordance with the IEEE 802.1Q standard mentioned in the present application.

It is also clear in the present application that the problem posed by the prior art is that the virtual circuits (including VLANs with a single Ethernet interface) are interpreted by layer 3 devices as being separate layer 3 subnets, which implies a separate layer 3 interface address for each VLAN. When applied to the VPN case, where the VLAN identifier is used to map incoming traffic to remote destinations over virtual circuits, this causes an increase in provisioning and resource usage, e.g. layer 3 address space (page 3, lines 18-24 of the application as filed). An object of the present invention is thus to avoid unnecessary address space wastage, in particular by permitting the customer device to interpret a group of VLAN identifiers (VIDs) on a given PE/CE interface as a single layer 3 interface (page 3, lines 25-29 of the application as filed).

Since Hama discloses only one VLAN with respect to a given customer device, rather than a multiplex of VID-based layer 2 virtual circuits, it cannot be considered as relevant to the claims of the present invention.

Even layer 2 virtual circuits are interpreted as virtual circuits between individual terminal connections within a VLAN, as the Examiner asserts, Hama remains irrelevant. The address resolution method proposed by the present invention does not make sense with such an interpretation, since it is easy to reach any customer within a VLAN by using the single VID available for this VLAN. In other words, only one layer 2 virtual circuit corresponds to the layer 3 address of the remote CE device in this case, which is an unambiguous situation which requires no address resolution.

As explained above, a problem occurs only when a customer device manages several VLANs with respective VIDs with respect to a PE/CE interface having a single layer 3 interface. Hama is thus inapplicable when assessing the patentability of the claims of the present invention.
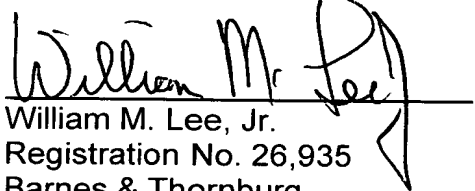
For the same reasons, Arndt cannot be considered as disclosing the sending of an address resolution request message through a PE interface over each layer 2 virtual circuit of a multiplex, since the ARP request of Arndt is sent from a source device, which is a device of a single LAN, and the ARP response is inevitably received at said source device.

Thus, the subject-matter of Claim 1 of the present application is not rendered obvious from the combined teaching of Hama and Arndt. The subject-matter of Claim 1 is thus believed new and non obvious over Hama in view of Arndt. The same applies to Claims 11, 20 and 25. The other claims are submitted to be allowable as well, in particular since they depend on an allowable independent claim, directly or indirectly.

It is therefore submitted that the claims are in condition for allowance, and the Examiner's further and favorable reconsideration in that regard is urged.

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Respectfully submitted,

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